

THE GRAZING BULLETIN

JUNE 1940



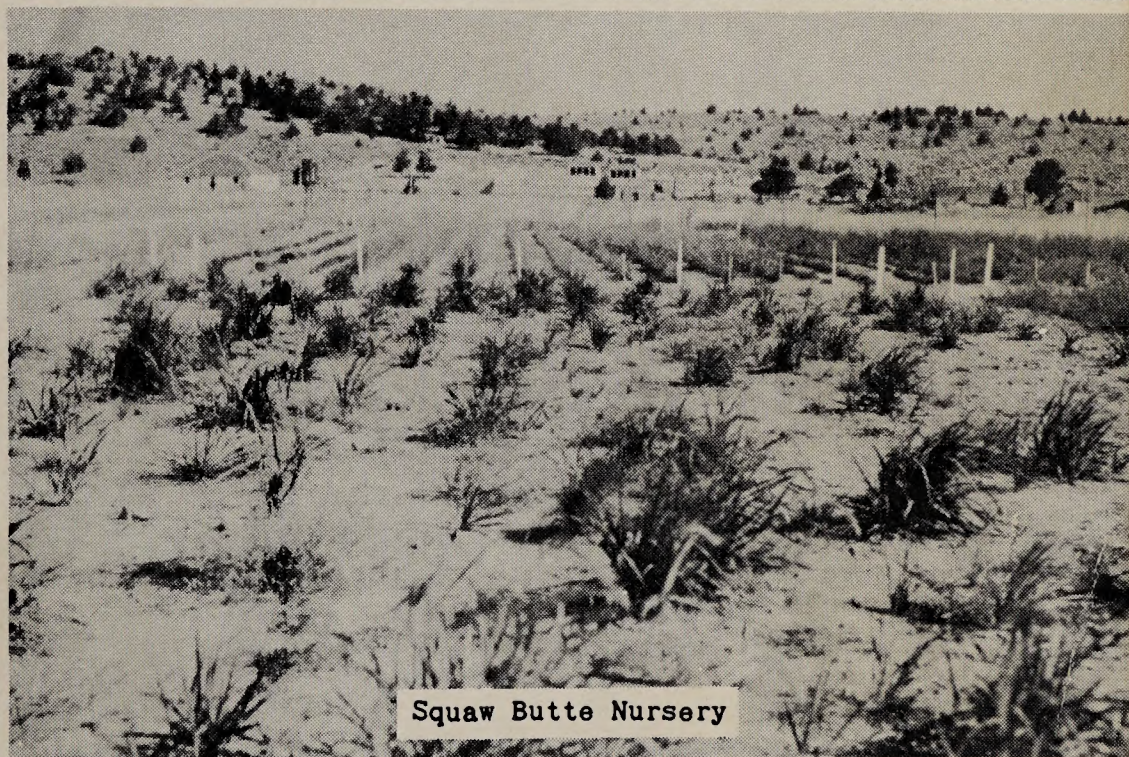
Squaw Butte--Range Man's Laboratory



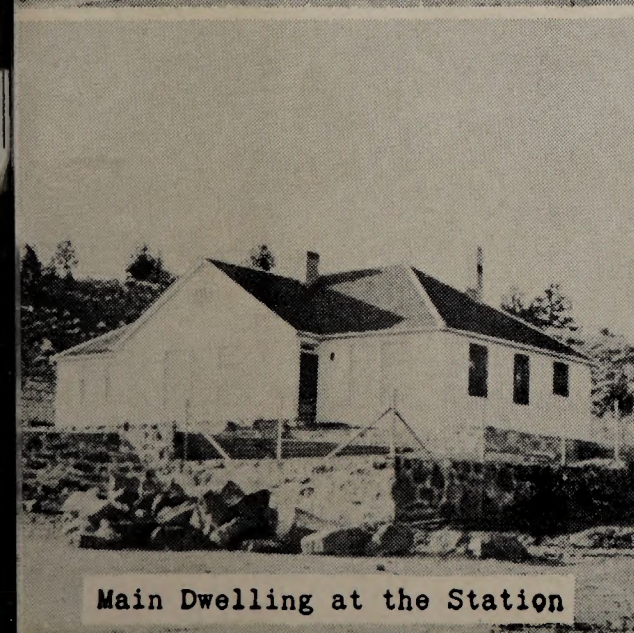
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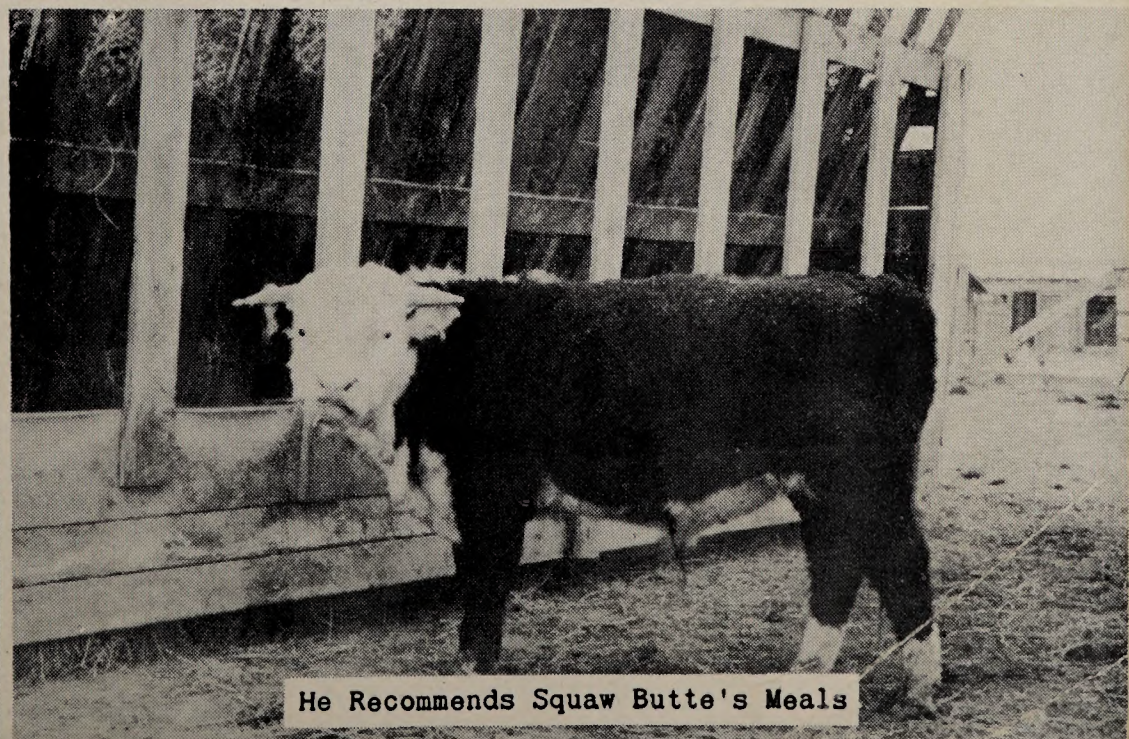
"Exhibit A"



Squaw Butte Nursery



Main Dwelling at the Station



He Recommends Squaw Butte's Meals

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THE GRAZING BULLETIN

Harold L. Ickes
Secretary of the Interior

Alvin J. Wirtz
Under Secretary

R. H. Rutledge
Director of Grazing

J. Q. Peterson
Editor-in-Chief

June 1940, Vol. 3, No. 3

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UNITED STATES
DEPARTMENT OF THE INTERIOR
GRAZING SERVICE

WASHINGTON, D. C.

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Congressman Edward T. Taylor (left), sponsor of the Taylor Grazing Act, receives unique gavel from Secretary of the Interior Harold L. Ickes at ceremonies in the Art Gallery of the Department of the Interior, Washington, D. C., on May 10, 1940. The gold-plated hammer with silver inscription is symbolical of the millions of staples, thousands of posts, and miles of fences erected on the Federal range by CCC forces under the Grazing Service of the Department of the Interior.

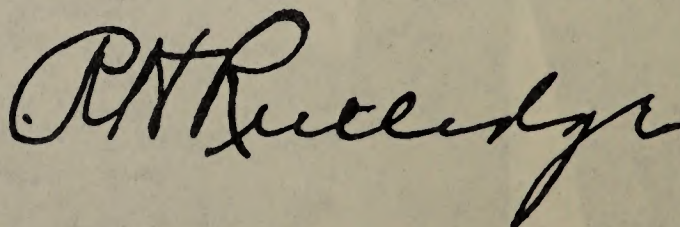
UNITED STATES
DEPARTMENT OF THE INTERIOR
GRAZING SERVICE

FOREWORD

In the solution of a mathematical problem one cannot go the entire way in one big step. One must take the problem, factor by factor, and by this process proceed from the known to the unknown. There's nothing mysterious about it. Just a logical, systematic procedure, step by step, to the answer.

So it is with the problems of range management. There is much that is known by the stockmen and much that is unknown to any of us.

I feel sure that with Squaw Butte as a proving ground and with the knowledge and the help of the stockmen, we shall be able to build upon what we know and to clarify or discover the solution of many of our problems.



R. H. Rutledge,
Director of Grazing.

Conservation Service, U.S. Department of the Interior, Washington, D.C. 20540. The following is a list of the names of the persons who have been instrumental in the development of the Grazing Service, U.S. Department of the Interior, Washington, D.C. 20540. The following is a list of the names of the persons who have been instrumental in the development of the Grazing Service, U.S. Department of the Interior, Washington, D.C. 20540.

SQUAW BUTTE--RANGE MAN'S LABORATORY

By Kenneth B. Platt
Acting Superintendent

Squaw Butte Range Station
Burns, Oregon

"Necessity is the mother of invention", says a familiar adage. When the need for something becomes great enough, someone will produce it.

The Squaw Butte Range Station is such a child of necessity. The dry ranges of eastern Oregon and adjoining States, after suffering almost continuous declines in productivity through the last two generations, have reached the point where it is imperative that some method be found to reverse this trend. That method must be such that it can be applied with the least possible expense and disturbance to the range livestock industry. To discover the integral principles of range and livestock management which will compose such a method is the purpose of the station.

The stockmen, Grazing Service officials, and Oregon State Agricultural College representatives who sponsored the idea for such a station, had in mind practical problems which directly affect livestock income or range welfare. They had long known that cattle lose weight badly in the fall on dry bunchgrass of the high plateau country of eastern Oregon--but why? There should be some way to avoid this weight loss so stock would winter stronger and fatten earlier the next season--but how? They had seen open ranges once rich with grass slowly transformed into almost worthless sagebrush, while in fenced pastures held for fall use the grasses thickened year by year until the sage died back to a trace--why? Would it be possible, by management methods, to reclaim brushy areas of open range in this manner? Would it be practical to seed grasses back into brushy area? If so, how? And what kind of grasses would be best? These and dozens of similar questions came to mind as these men set about choosing an area where such questions might be answered.

Scope of Study

The 16,000-acre Squaw Butte location, some 40 miles west of Burns, Oregon, was selected for this work because it includes representative dry range of various types at elevations from, roughly, 4,000 to 5,000 feet.

Briefly, Squaw Butte is gathering information on range restoration, water developments, cattle management, influence of game animals and rodents, and effect of climate. Each of these main problems, of course,

has many subdivisions. For example, range restoration includes, among others, studies in pasture rotations, reseeding, and rodent and poisonous plant eradication; cattle management includes type improvement, disease control, and studies of nutritional deficiencies in range forage at various seasons. Observations are made on the effect of dual use by livestock and wildlife.

In order that the work program at the station may be kept fully practical and that questions of prime importance to range users may receive first attention, a Stockmen's Advisory Committee has been named. Fifteen men, representing some 30,000,000 acres of range lands in Oregon, Idaho, Nevada, and California, compose this committee. By their own choice, they serve without pay. Before projects are undertaken, they are submitted for the consideration of this committee. Aside from technical information needed to plan and execute the program, all problems now being explored have been initiated at the request of either the committee members or other stockmen through them.

All stockmen within the range of this station are urged to take full advantage of its facilities as a means of helping them to interpret their own range problems. Results if good are worthless unless they are put to use.

The Squaw Butte Range Station is the rangeman's laboratory where problems too big for one man to handle can be studied under practical methods. The station will help you in proportion to the use you make of it.

Vegetation

Dominant grasses in the Squaw Butte area include western wheatgrass, western needlegrass, Idaho fescue, and Sandberg's bluegrass. Common but not abundant are Nevada bluegrass, big bluegrass, June grass, and giant wild rye. Cheat grass is present only on two small areas, former sheep bed grounds.

Palatable shrubs include bitterbrush, rabbitbrush, and some wild currant. Big sagebrush, with generous interspersions and occasional islands of black sage, three-tip sage, and silver sage dominate the aspect of the entire area up to about 4,400 feet elevation. Beginning at this level is a scattered stand of western juniper which thickens

to about a 20 per cent cover on the higher ridges.

Only one poisonous plant, tall larkspur, is present in significant quantities. Smooth horsebrush, said to be poisonous to sheep, is present only as occasional specimens.

Until it was fenced in 1935, this area had been grazed in the same manner as the millions of acres of similar range extending from 20 to 300 miles in every direction from the station. From the late 70's until about 1915 it was grazed chiefly by horses and cattle, being used at all seasons. From 1915 to 1935, it was used chiefly for sheep which grazed there in fall, winter, and spring. Parts of it were mistakenly dry-farmed and necessarily abandoned. Other parts saw grazing homesteads come and go.

Typical spring-fall range, most men would call it, but with really good summer range far too scarce to support all the livestock in this area, many cattlemen must use this type of range throughout the grazing season.

Cattle Studies Made

Squaw Butte is a cattle station, earlier plans to operate both sheep and cattle having been abandoned after two years' trial for lack of sufficient station-area and suitable summer range for sheep. It is felt, also, that the sheep problems of this area are being well studied at the U. S. Sheep and Range Experiment Station, Dubois, Idaho.

Squaw Butte is divided into seven approximately 2,100-acre pastures, centering toward the 240-acre administrative area. Four of these pastures now are being used in a three-pasture rotation and deferred grazing trial in comparison with season-long grazing. Each pasture had the same carrying capacity at the beginning of the study. From 25 to 30 cattle, depending on the year, are grazed on the season-long pasture, and three times as many are grazed on the three-rotation pastures, each carrying the full number roughly one-third of the season. Each pasture in turn is deferred for fall use two years in succession, making a six-year rotation. Monthly cattle weights and seasonal forage surveys record the results. Two other areas are in use as pastures for replacement cattle and miscellaneous extra stock. One which is badly infested with larkspur was originally planned for sheep use and now is being used for an investigation of larkspur eradication. Six 160-acre enclosures are used for various reseeding, supplemental feeding, and other projects.

The cattle are purebred and grade Herefords, selected to include both high and low quality individuals. This spread in quality

will allow comparisons of thrift, grazing ability, breeding efficiency, and cash returns from the two types of cattle under exactly the same conditions of management. Bulls are all purebred Herefords. It is planned to obtain bulls from the same herd for 10 years as a check on the possibility of evening a herd of mixed grades by this method.

Individual weights at the beginning and end of the grazing season, and monthly group weights by ranges, are recorded and used to check the efficiency of the different grazing methods.

These weights have shown a close correlation between the declining protein content in the dominant grasses and the weight losses in the cattle, both occurring in late summer and fall. Results to date point very definitely to the need of a protein supplement at this season.

Observations on grazing habits of the cattle in relation to water so far indicate that salting has very little effect on their distribution on the type of dry range here concerned. The optimum distance which cattle will travel for water on the station seems to be from one to one and a quarter miles. During August 1939, the cattle lost weight severely, indicating that they would rather go short of feed than travel more than one and one-half miles to ample feed, even though the weather was not extremely hot (maximum, 95; minimum, 36; mean, 68.4). Since the station area is neither extremely rocky nor particularly steep, these observations seem to indicate that better range use from individual water sources may be obtained when ample stock water is properly placed within reasonable reach of the forage. They indicate also that cattle will travel shorter distances to and from water and feed than has been generally assumed in this area.

Station Improvements

There is no living water, and the station produces no cultivated crops. All enclosures are supplied with water piped to troughs from a well, 587 feet deep, located on the administrative area. Automatic floats in all troughs control the flow from a 33,000-gallon concrete storage tank. This well water is supplemented by snow water stored in 12 earthen reservoirs distributed upon the various ranges and is used only when the meager run-off storage has been exhausted. Not all these reservoirs are successful, and none of them holds water throughout the season in ordinary years.

Other station improvements include some 90 miles of wire fences and about 40 miles of roads; corrals, chute, and scales; dwellings, office, assembly hall, laboratory, shop, and other buildings. A 13-acre nursery site con-

tains trial plantings of about 60 species of grasses, legumes, and browse plants.

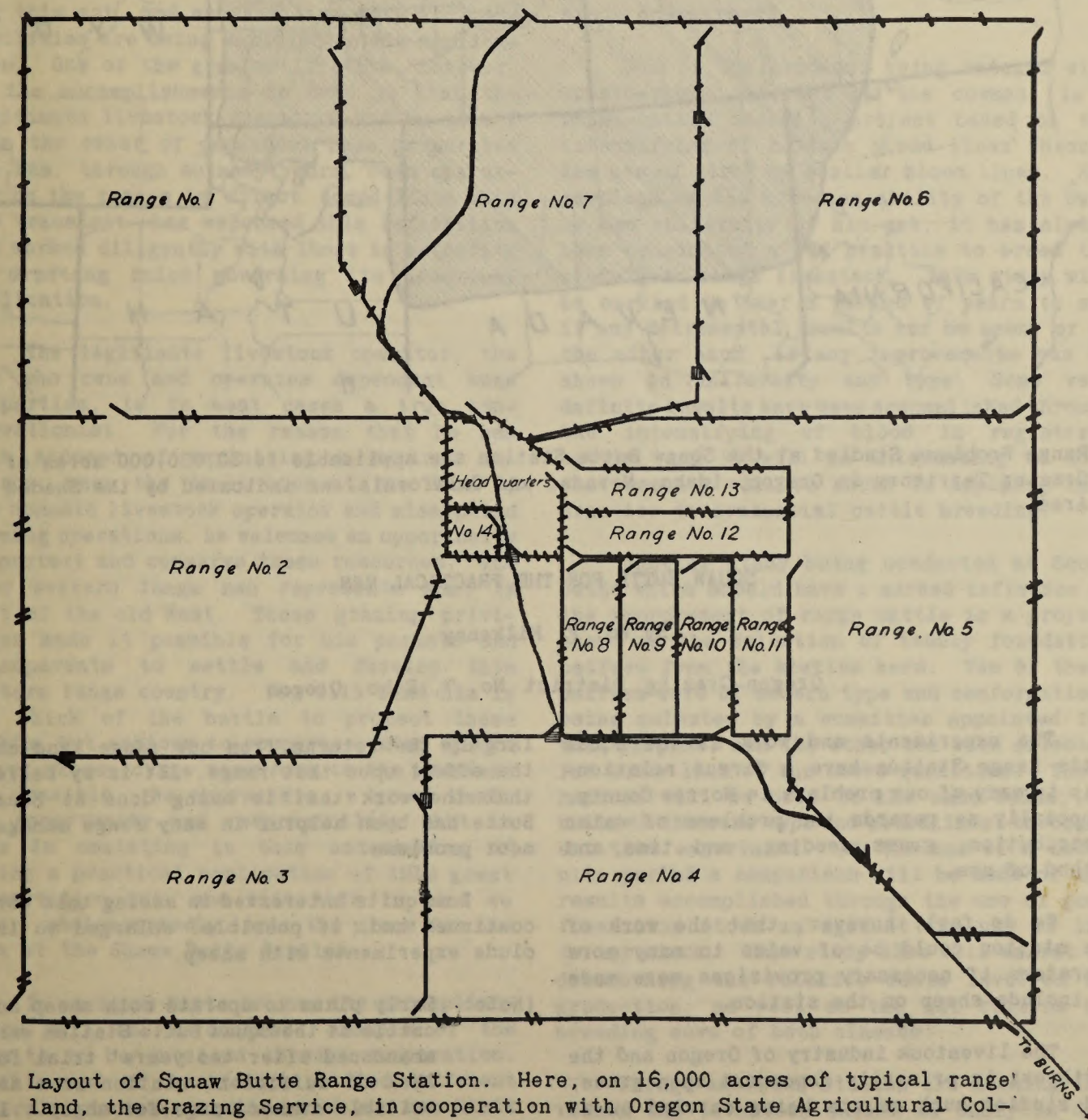
All the improvement and development work at the station has been performed by CCC enrollees. Originally the site of a full-strength camp and later a side camp, the station now employs a daily crew of 15 boys from the Gap Ranch Camp on maintenance and minor improvements.

Cooperation

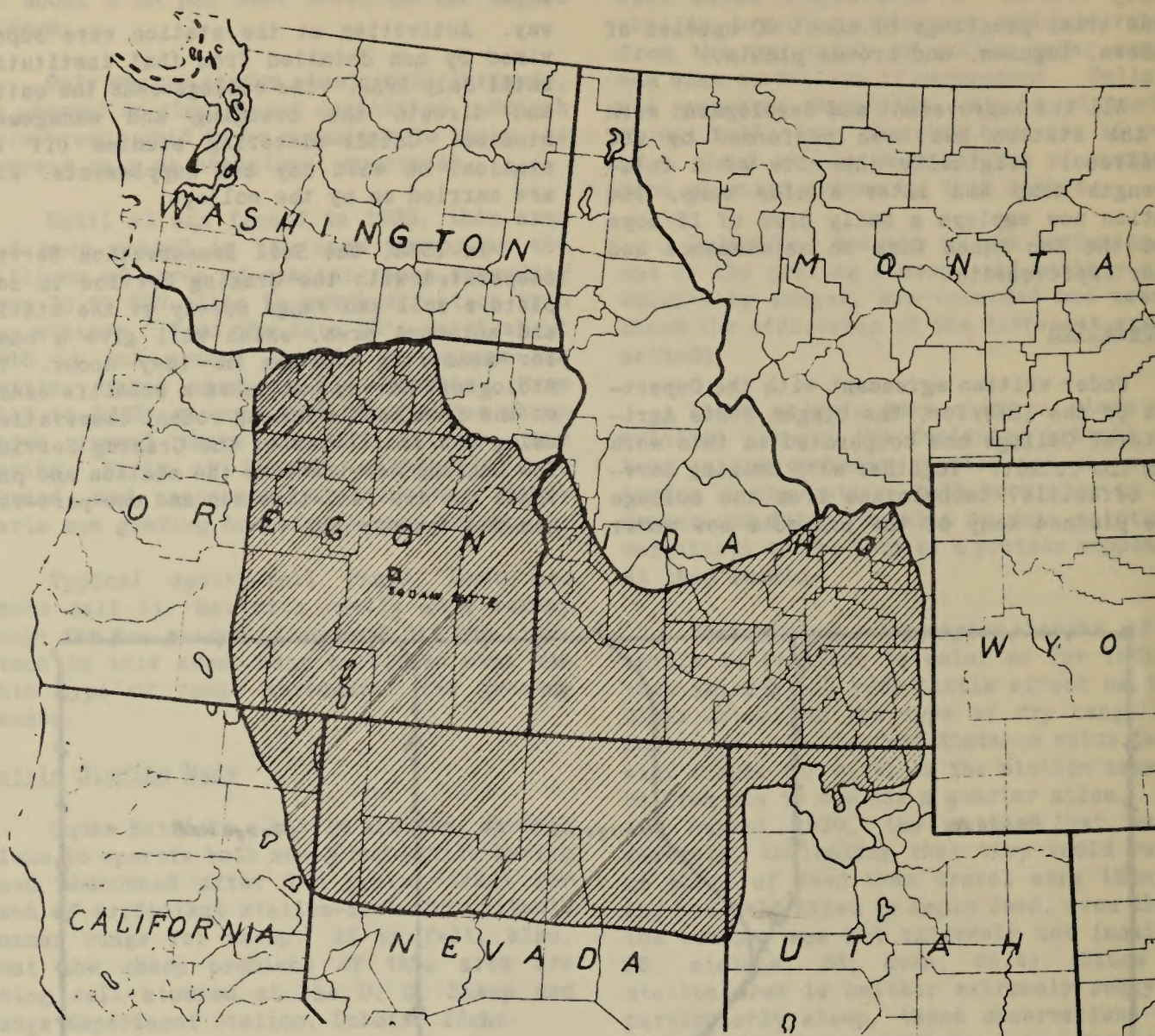
Under written agreement with the Department of the Interior, the Oregon State Agricultural College has cooperated in this work from the outset. Together with Grazing Service officials, technicians from the college have planned many of the projects now under

way. Activities at the station were supervised by men detailed from that institution until July 1939. The college owns the cattle and directs the breeding and management studies. Cattle-wintering studies off the station, on wild hay and supplements, also are carried on by the college.

In 1938, the Soil Conservation Service cooperated with the Grazing Service to complete a soil and range survey of the station and adjacent area, which will give a basis for measuring changes as they occur. The Biological Survey has taken a wildlife census on the area and is making rodent observations using CCC facilities of the Grazing Service. The Grazing Service owns the station and provides the two full-time men and one part-time man who operate it.



Layout of Squaw Butte Range Station. Here, on 16,000 acres of typical range land, the Grazing Service, in cooperation with Oregon State Agricultural College, is studying practical range and livestock problems common to an area of 30,000,000 acres in the Northwest.



Range Problems Studied at the Squaw Butte Station are applicable to 30,000,000 acres of Grazing Territory in Oregon, Idaho, Nevada, and California, as indicated by the Shaded Area.

SQUAW BUTTE FOR THE PRACTICAL MAN

By Wm. P. Kilkenny

Oregon Grazing District No. 7, Echo, Oregon

The experiments and work at the Squaw Butte Range Station have a direct relationship to many of our problems in Morrow County, especially as regards the problems of water distribution, grass seeding, and time and method of use.

We do feel, however, that the work of the station could be of value to many more operators if necessary provisions were made to include sheep on the station.

The livestock industry of Oregon and the Northwest is primarily dependent upon grass, and studies such as are being carried on at the Squaw Butte Station are a real help to the range operators of the Northwest. The time and method of grazing determines very

largely the returns from our range land and the effect upon that range. It is my belief that the work that is being done at Squaw Butte has been helpful in many range management problems.

I am quite interested in seeing this work continued and, if possible, enlarged to include experiments with sheep.

(Note: Early plans to operate both sheep and cattle at the Squaw Butte Station were abandoned after two years' trial for lack of sufficient station-area and suitable summer range for sheep. It is felt that the sheep problems of this area are being well studied at the United States Sheep and Range Experiment Station, Dubois, Idaho.)

SQUAW BUTTE STUDIES HELP CATTLE BREEDER

By Harry I. Stearns
Chairman, Squaw Butte Advisory Committee

Before making any mention of Squaw Butte and its possibilities, I would like to sum up, very briefly, the results of the application of the Taylor Grazing Act on the range livestock industry in this district.

It seems incredible that, in so short a time, an abuse in the use of a resource so great as our public forage lands, could be so nearly corrected. It is true that a big task is still ahead. To link these grazing privileges to the lands most dependent upon them is a big task, but men familiar with the problems involved were responsible for drafting this act, and men familiar with its possibilities are being employed in its application. One of the greatest factors, however, in the accomplishments to date is that the legitimate livestock operator--and by this I mean the owner of dependent base properties who has, through so many years, been operating on the ranges in direct competition with the transient--has welcomed this legislation and worked diligently with those in authority in drafting rules governing its practical application.

The legitimate livestock operator, the man who owns and operates dependent base properties, is in most cases a true conservationist. For the reason that he has been accused of exploiting a natural resource, when the fault lies at the door of the nomadic livestock operator and misapplied farming operations, he welcomes an opportunity to protect and conserve these resources. The true western range man represents what is left of the old West. These grazing privileges made it possible for his parents and grandparents to settle and develop this western range country. You will find him in the thick of the battle to protect these rights, but anxious to cooperate in an effort to put these forage resources to the greatest use possible. We appreciate, a great deal, the opportunity and responsibility that is ours in assisting in this undertaking of making a practical application of this great conservation act, and with this in mind we enter, wholeheartedly, into the plans for the work at the Squaw Butte Station.

To us Squaw Butte is, and its accomplishments will be, a concrete example of the results to be obtained through cooperation. In this work at the station we find different Federal agencies, together with our own State College and representatives of the range livestock industry, joining hands in a cooperative effort to test out the best methods

to use in the conservation of a great natural resource and the preservation of an industry dependent upon it. I have a very great respect for the abilities of the men representing the Federal agencies and our State College in this great cooperative effort, but I do not minimize the part to be played by each individual range livestock operator. As these different studies are carried out in this stockman's laboratory, our job will be to act as a sort of proving ground, for these grazing studies are useless, as far as the range man is concerned, unless a practical application can be made of them in our range livestock operations.

One of the studies, being watched with considerable interest by the cowman, is a range-cattle breeding project based on the intensifying of certain blood lines through the use of sires of similar blood lines. Regardless of the breeding ability of the bull or the uniformity of his get, it has always been considered a bad practice to breed too closely on range livestock. This study will be carried on over a period of years to see if any detrimental results can be seen, or on the other hand, if any improvements can be shown in uniformity and type. Some very definite results have been accomplished through the intensifying of blood in registered cattle, and it will be interesting to note what results will be shown in applying this practice to commercial cattle breeding.

Another study being conducted at Squaw Butte which should have a marked influence on the improvement of range cattle is a project based on the selection of twenty foundation heifers from the station herd. Ten of these heifers were of modern type and conformation, being selected by a committee appointed for that purpose, and the other ten were selected for their lack of the above qualities. These heifers will be bred to the same bulls, or bulls of the same type and bloodlines, throughout this experiment. At the end of a definite period a comparison will be made of the results accomplished through the use of good foundation stock as against the use of inferior stock. This study also will assist in determining the relative costs involved in production, as well as the net returns on breeding cows of both classes.

Forage analysis studies are seeking the reason why livestock shrink so badly on dry feed in the fall. Supplemental feeding studies later will determine how to avoid this shrinkage. A range rotation and deferred

grazing system is being tried out to see if there is not some economical way to handle livestock so as to get increased forage yield from our ranges. How far cattle can go for water without damaging the feed or losing weight, what kind and what size reservoirs to build under various conditions, possibilities of reseeding grasses in badly brushed areas, and proper rates of stocking for eastern Oregon and similar ranges are among the other questions being investigated.

The above projects and many other studies of a like nature are examples of the type of work carried on at Squaw Butte, which can be applied to a practical range livestock operation. Because of the type of studies being carried out, and the fact that the station

was set up primarily for our benefit, we should consider Squaw Butte as our station and dedicate our efforts, so far as our abilities permit, to the task of building a more stable and economic range livestock industry.

As chairman of the Squaw Butte Advisory Committee, and as a stockman interested in the results accomplished through proper livestock and range management, I ask the earnest consideration of all range livestock people to the program at Squaw Butte. The station was set up by men who realize the possibilities it holds as a guide to proper range management, and it will go far toward a more equitable solution of the problems brought about by the application of the Taylor Grazing Act.

* * *

VALUE OF RESEARCH TO RANGE LIVESTOCK INDUSTRY

By Walter M. Gilmer
Nevada Grazing District No. 1
Metropolis, Nevada

When the pioneers in western livestock production began to convert the grasses, browse, and other range forage into meat for consumption in a commercial way, they soon found out, in most instances, that in order to round out a year's operation, the supplementing of some livestock need, not available upon the range, was imperative. In high mountainous areas winter snows were likely to cover the feed so deeply and so long, that cattle and horses carrying a good covering of fat at the beginning of winter emerged at its conclusion barely able to move about, and these animals not infrequently perished outright in extremely large percentages. The cure was to produce feed artificially to supplement the range during such periods. In desert areas where snow lay scantily or not at all, water was found to be inadequate at certain times of the year for livestock to properly utilize range feed, so the range had to be supplemented in its need for water.

As time passed, the demand to utilize range feed increased. Newcomers came and shared the ranges with those previously there; they, in turn, subdivided again and again with other users of more recent origin. There was, also, increased use by those already in the field. Supplementing the range grew from a beginning of possibly 30 to 60 days during the year, until today a supplementing period of 120 to 180 days or more is very common practice. So the western

range livestock operator now not infrequently finds that instead of supplementing the range feed with privately owned and produced feed, his owned feed is supplemented by a limited amount of range feed.

To the uninformed observer it might appear that the western livestock operator is very fortunate to have available even a limited amount of feed to go with that produced upon his privately owned holdings; that he is enjoying a unique advantage in livestock production. That a man is fortunate to have available feed for his livestock, or shelter, clothing, and feed for his family, irrespective of where he may reside, may be readily admitted; whether there is an advantage attached depends upon the surrounding conditions. The western livestock operator finds that his privately owned property, both real and personal, is contributing in a very substantial degree toward supporting the tax structure of his community; that the center of consumption of his product is east of the Mississippi River, while the mass of production is west of it, so that quite heavy transportation charges on his product are encountered before it reaches the consumer's table. He finds that his owned feed is produced at considerable cost, that the weather and moisture conditions are often adverse for feed production, and that in the final analysis his product must be produced at a figure that will permit it to reach the consumer to be

sold in competition with other food products within the price range the consumer is willing to pay for his meats.

To convert the range feed, and the privately produced supplementary feed, into livestock products within the price range the consumer will pay, and, at the same time, make a fair return upon his labor and investment, is a job that requires prudent management and elimination of all possible elements of risk.

Not only is his own well-being wrapped up in his ability to successfully produce, but there are other resultant benefits from successful range livestock production such as increased freight receipts to transportation systems; increased business for processors, wholesalers, and retailers; employment for labor; sales by those concerns that sell to livestock producers; maintenance of substantial taxable wealth in range communities; and perhaps last but not least, the maintenance of meat as a major part of our national diet.

Investigations of range problems, to the end that the present carrying capacity may be protected and increased without injury to local and national benefits accruing from range livestock production, are obviously of vast importance, both to future range users and to all indirect beneficiaries of this industry. According to recent data, the range area comprised in national forests, Federal ranges, and other Federal reservations in the eleven western States, amounts to approximately one-fifth the area of the United States. The present and future use of this vast area will be for the production of livestock, in conjunction with privately owned feed. The carrying capacity of the combined Federally and privately owned feed sets the production capacity of the range livestock industry.

Studies to determine the best feeds adaptable to local areas; how maximum production may be secured within the limited price range for livestock; best time and manner to graze a range; proper balance of wild life on the range with respect to available feed; effect of rodents on ranges, both valuable and harmful; effect of predatory animal control in decreased livestock losses and increased loss of range feed due to increased numbers of rabbits, gophers and other grass-eating animals; effect of more evenly distributed grazing through development of water--all are matters that have a bearing on livestock needs upon the range. Also of important bearing are the questions involved in proper utilization of plants not of particular value as feed, such as big sagebrush, to conserve winter snows to the end that spring moisture may be available for grass growth at the proper time, to shade ranges during heat waves, to prevent erosion during sudden downpours of rain in summer, and at the same time not create a situation where the sagebrush will deprive grasses of needed moisture to such an extent that a range will be too densely covered with sage and too sparsely covered with grasses and browse.

The Squaw Butte Range Station can render invaluable service to the livestock industry through a practical approach to these everyday problems of the range man.

To sum up, the range since its earliest use has nearly always had to be supplemented with other livestock needs not provided by Nature on the range. The present demand for range feed, combined with the continued increased demand that probably will develop in the future, warrants the effort and time to devise ways and means whereby that demand may be met to the fullest possible extent under the climatic and moisture and soil conditions Nature has provided in the range area.

* * *

RANGE - FARM - CITY DEVELOPMENTS INTERDEPENDENT

By J. N. Jones
Oregon Grazing District No. 3, Vale, Oregon

I have lived in Malheur and Harney Counties all of my life and I expect to spend the remainder of my days right here, so I have been able to watch conditions change from year to year.

In the early 1900's we had an abundance of range and grass and we raised a sufficient amount of hay to winter our livestock. About

1913 a railroad was built from Vale, Oregon up the Malheur Canyon to Crane, Oregon. This opened the great interior section of Eastern Oregon to rail service, and it changed the livestock picture.

Stock began grazing in from the Snake River Valley up through the low hills to higher country until, along in June or July

when the feed began to dry up or get short, they were loaded on the railroad and shipped to all parts of the West for summer range. This could not happen until the rail service made it possible.

This went on until along in 1918, 1919, and 1920, when the livestock men of the interior found themselves almost eaten out of a house and home, as far as grass was concerned, by transient livestock. Then hay and feed went sky high. Hay sold for \$20 to \$25 per ton. The grass had been killed out to such an extent that stockmen tried to carry on by supplementary feed. The result was that many livestock outfits went bankrupt, and a cry went out for more hay.

About 1930 the Government stepped in and built two small reclamation projects, bringing under production about 80,000 acres of new irrigated land. Before these projects were completed, Malheur County had about 100,000 acres of irrigated land, of which about 50 percent was short of water; since the completion of these projects we have plenty of water here for the 180,000 acres, thereby increasing our production about 100 percent.

Today hay in Malheur County is selling from \$3 to \$4 per ton and there is not much demand for it even at that price. We will be faced in the spring of 1940 with about 100,000 tons of surplus hay with a new crop coming on during this season.

While I consider myself a livestock operator, I have been connected with a small country bank dealing principally in livestock since 1913. About 1930 we began encouraging the feeding or finishing of feeders for several reasons. We could see that when all of the new lands were developed we would have a surplus of feeds. A livestock bank has its heavy liquidations in the fall of the year when beef cattle and lambs are sold, so naturally its loans and discounts run below normal at that time of the year. The officers of the bank figured that if we could develop the feeding of livestock here in the Snake and Malheur River Valleys, it would give us a new outlet for the loaning of our money through the winter months from about November until April, at which time we are low in our commercial loans. A feeding industry would also create a home market for the producers' feeder cattle and a market for the farmers' hay and grain. If we are reasonably certain that the livestock producer will have a ready market for his cattle, we do not hesitate to loan him money. If we are reasonably certain that the farmer will have a ready market for his hay and grain, we do not hesitate to loan him money.

Some may wonder why we do not ship our hay and grain to a better market. The reason is that we are so far from a market that the

freight rate is too high on anything as bulky as hay, and the only way that we can beat the freight rates is to condense our produce into meat, sugar or other agricultural products high in value per unit of weight.

We are raising about 20,000 acres of sugar beets. When this crop is reduced to sugar, we still have the pulp and syrups which make good feed for livestock, so that does not solve our overproduction of feed to any great extent. In my opinion the solution to our problem is more livestock.

While this plan has worked to some extent we are still out of balance. In other words, we find ourselves with a large surplus of feed and a shortage of feeder livestock. We are now feeding in the immediate vicinity of Vale, Oregon, about 12,000 to 15,000 head of cattle, when we should be feeding 60,000 to 75,000 head of cattle to consume the feed we are raising.

The officers and stockholders of this bank, being livestockmen and farmers as well as bankers, are naturally very much interested in this plan. We have seen times here in Eastern Oregon when we could hardly sell feeder cattle at any price. One of those years was 1934 when there was a general drouth in the Middle West, when crops were short and feeds high. I have seen good feeder steers sell for as low as 3 to 3½ cents per pound. I have sold thin cows as low as \$16 per head.

There is always a market for fat livestock. Sometimes the price is cheap but when it is cheap on fat cattle you can bet your last dollar that it will be a lot cheaper on thin or feeder cattle. There are times when meats are high and feed cheap. Then feeders are almost as high as fat cattle. That is when the farmers are marketing feeds in the form of meat. As the old saying is, "Wheat is potential meat."

Our ranges will not support more livestock if they are handled as they have been in the past. We who have been in the livestock business for any length of time have seen our ranges killed out by overgrazing, and grazing at improper seasons.

In my own mind I am thoroughly convinced that by proper range management we can raise the carrying capacity of our grazing land as much as 50 per cent without much trouble. If we could do this, the individual livestock operator should be benefited, for with the same plant he can run more livestock. The hay-raiser will benefit for the reason that there will be more feeders to be fed. In this country if the farmer and livestockman are taken care of, the merchant, banker, and all other businessmen will take care of themselves, as they are about 90 percent dependent upon the livestockmen and the farmer.

I am the owner of a considerable amount of range land here in Eastern Oregon, and I have done some experimenting of my own in trying to preserve the natural grass coverage of my privately owned lands. However, it is difficult to carry on an extensive experiment for any length of time, and it is too expensive for the private individual. I have been a member of the advisory board of the Squaw Butte Range Station for several years, and it has been very interesting to watch some of the experiments which are being carried on there. I believe that the range livestock man is going to learn a lot from that station.

It is located in the middle of the high desert in Harney County, Oregon, and it is typical of a large part of our ranges of the West. The work being carried on there is under very efficient management. It is all practical to the livestockmen, and I think that they should get solidly behind this, for we can learn a lot from the work there that will benefit us.

When we think of the money some of our great industrial plants spend each year in searching for new ideas, information, principles, designs, materials, and methods for improving their products or increasing their output, our own efforts in this field seem woefully inadequate. For example, I understand that to build one new model of an automobile costs into hundreds of thousands of dollars just for experimental purposes to find its good and bad points. Now if these people can afford to do these things, we can surely spend a little time and effort in our range laboratory for the livestock industry. To my knowledge it is the only livestock station of its kind.

Things are changing, fellow livestock men. We should prepare ourselves for all these changes as they come. Remember the price of livestock in the fall of 1934! Some change between then and the fall of 1939!

* * *

SEASONAL FORAGE STUDIES IMPORTANT

By Asa L. Williams

Idaho Grazing District No. 1, Boise, Idaho

The experiment to determine, by chemical analyses, the feed values at different seasons of all grasses and browse on the Squaw Butte Station is a good one. If we can find out just what value each plant has at each season we will be in much better position to manage both our ranges and our livestock.

After grass has dried up on the open range during August and September, stock usually begin slipping. At that time of year the grass seems to lack the strength to hold them up. The hot weather holds the stock close to watering places, and they do not get out and get enough food. I believe it is entirely practical to feed a little cotton cake or soybeans to supplement the range at that time. I have done this with sheep off and on for a number of years, and always with good results. In fact, I believe it is the only thing to do with early-lambing ewes when good aftermath or other green feed is not available for flushing.

The Idaho shed-lambing has such a heavy overhead expense from his extra feed, labor, and shelter investment that he figures he must market a 100 percent lamb crop at a

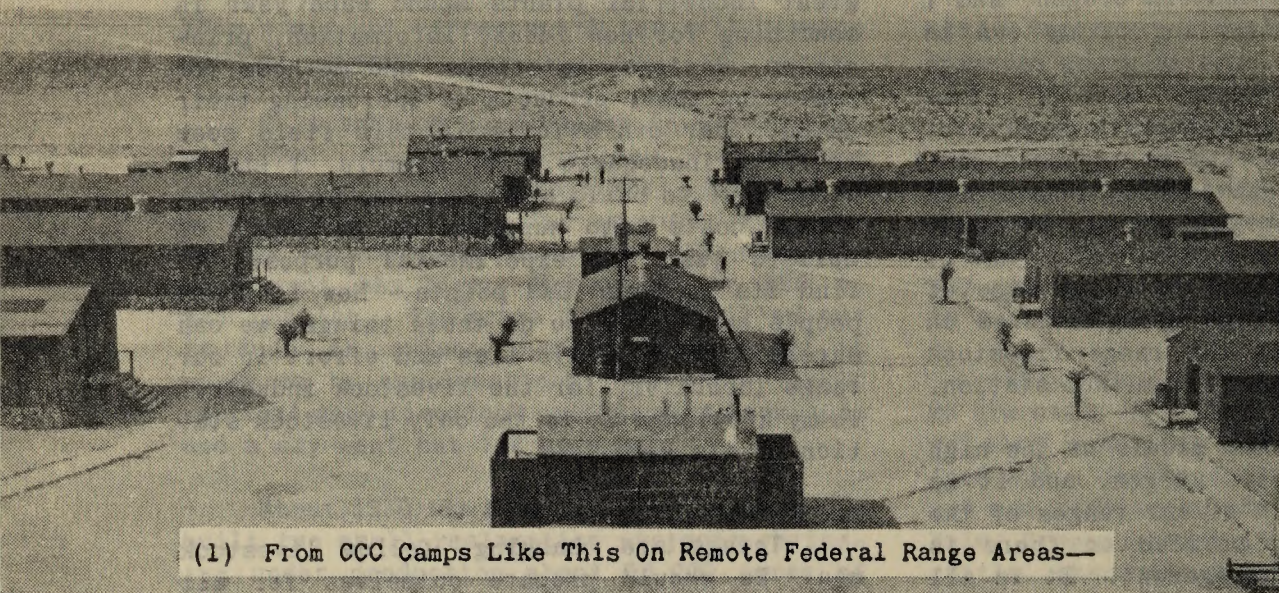
good price just to break even. Any profits come out of the lambs above a 100 percent crop which he can market. It is easy to see that he cannot afford to take chances on a light lamb crop. Yet, every so often, there comes a fall season when on some ranges feed conditions cause the ewes to breed slowly and be hard to settle. Next spring's lambing season is long and expensive, and twin lambs are scarce. When accounts are settled next fall, you will see a lot of red ink.

If the chemical tests the Squaw Butte Station is making will show what kind of season causes this condition, when the condition begins to prevail on the range, and what supplemental feeds will remedy it, this information alone will save Idaho sheepmen enough money in one year to pay for the station many times over.

Where there is browse with grass I believe it is a better all-season range, but we do not know enough about this. I would like to see more tests made of feed values of different kinds of browse as well as grasses. If we can get enough tests we may be able to tell what kind of supplement we need, how

APRIL 1935 through

Bridges.....
Fences.....
Reservoirs.....
Springs.....
Wells.....
Cattle Guards.....
Corrals.....
Truck Trails.....
Stock Trails.....
Permanent Check Dams.....
Temporary Check Dams.....
Other Flood Control
Structures.....
Poison Plant Control.....
Insect Control.....
(In cooperation with
other agencies.....)
Rodent Control.....
Impounding and Large
Diversion Dams.....



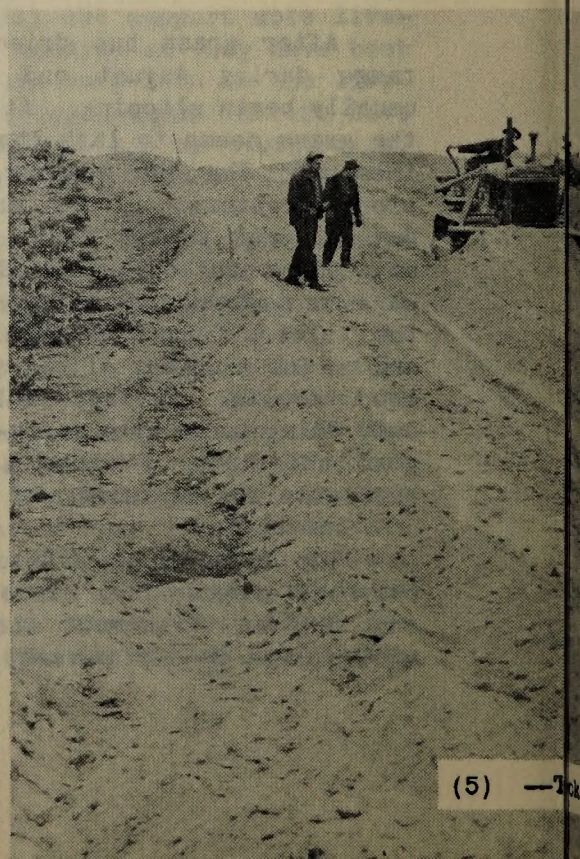
(1) From CCC Camps Like This On Remote Federal Range Areas—



(2) Enrollees Build Stock Water Reservoirs,



(3) Construct Boundary Fences,



(5) —

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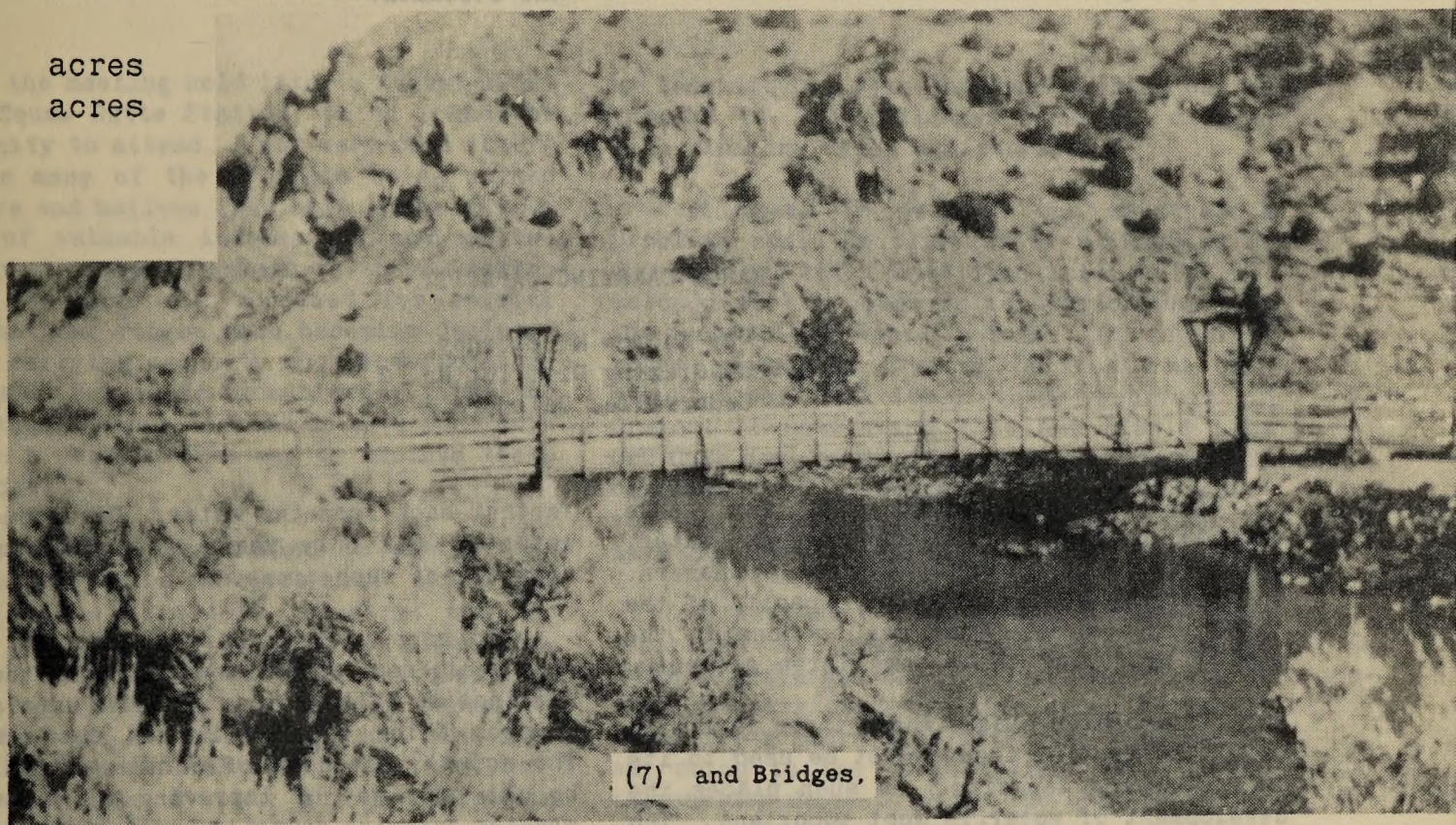
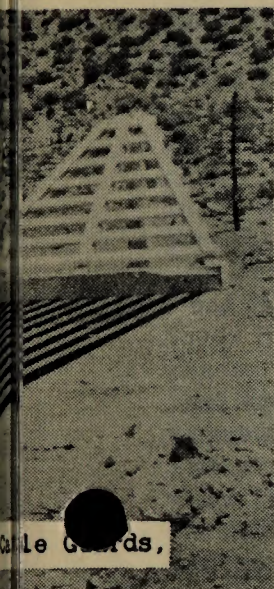
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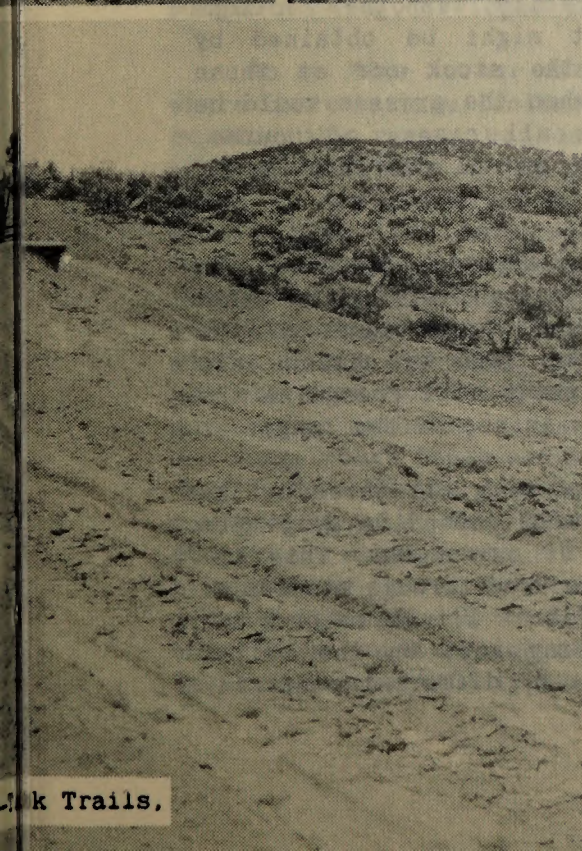
..... 235
..... 3,104.3 miles
..... 238
..... 539
..... 173
..... 350
..... 259
..... 6,530 miles
..... 2,123.6 miles
..... 6,240
..... 47,223
..... 276
..... 354,824 acres
..... 112,142 acres
..... 782,307 acres
..... 5,329,633 acres
..... 722



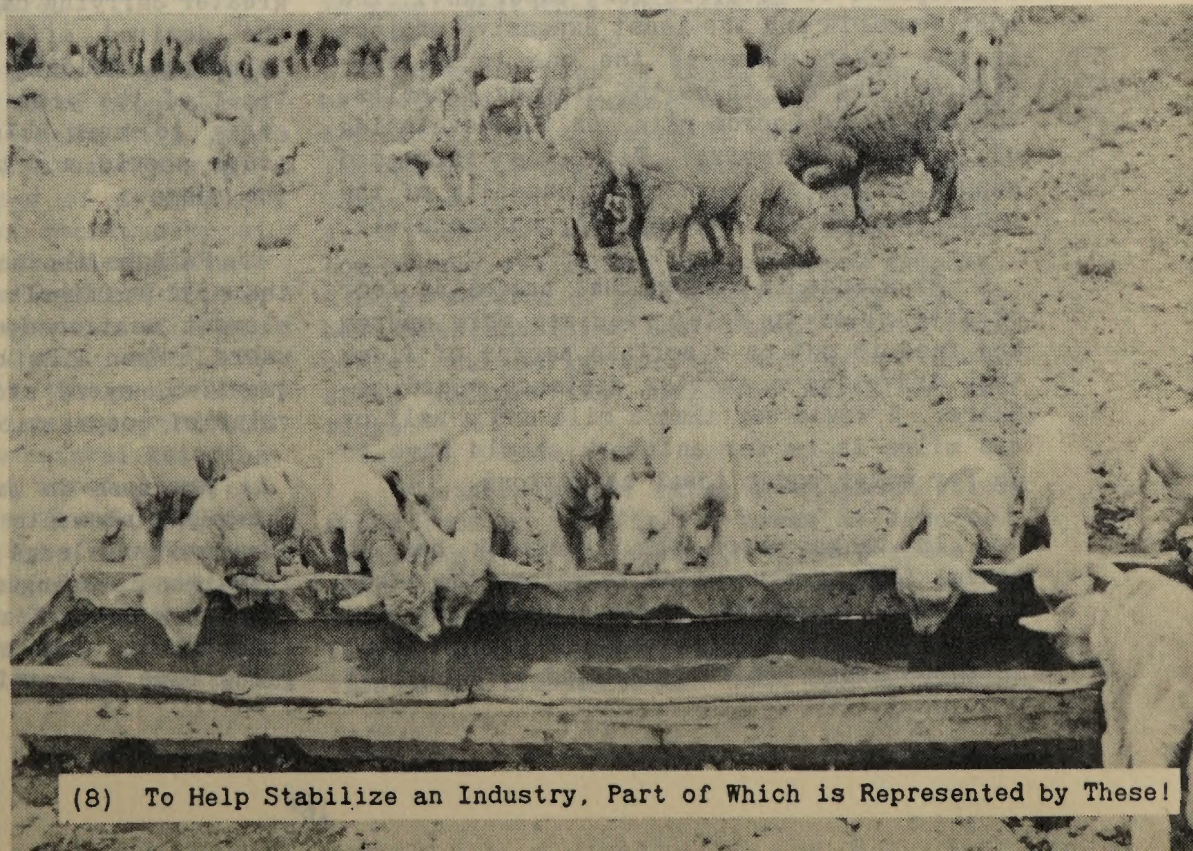
(6) --Stock Driveways,



(7) and Bridges,



..... k Trails,



(8) To Help Stabilize an Industry, Part of Which is Represented by These!

much to feed, and when to begin feeding it, according to what plants are on a range.

Information like that could save the cowmen, especially, large losses every year. Good late summer and fall range is at a premium all through this country. Every year the bulk of the cattle in this area lose weight through the last 60 to 90 days of the grazing season, until they are put in on hay meadows or hold pastures. A lot of these reserve feed supplies do not last until time to go into the stacks, and more weight is lost before feeding begins. By that time many of the wet or calvey cows are so thin they require special feeding and care all through the winter. Such cows are bound to be a drag on the outfit. Some usually are lost, some lose their calves, and some do a poor job of raising the calves then at side or they drop next spring.

In the old days when grass was plentiful, winter weight losses were not so important because they were quickly made up on the summer ranges. Today comparatively few of us have that kind of grass. I do not know of anyone summering on Federal range who has grass like that. Grass still is our cheapest feed, but it is not cheap enough that we can afford to throw away the gains made on it each year if there is any economical way of holding those gains.

For these reasons I would like to recommend that the chemical analysis study be kept up until we know just when each of our main feedplants usually starts losing its strength. I would also like to recommend that the Squaw Butte Station test different kinds and amounts of supplemental feeds for use at that season. Both these questions are mighty important to the stockmen.

* * *

RANGE CARRYING CAPACITY

By George M. Tierney
Nevada Grazing District No. 2,
Cedarville, California

The carrying capacity of any range depends largely upon three things--water, forage, and the common sense of the users. The increase in the carrying capacity of the range depends upon what can be done in the way of improving these same three elements.

In isolated places where there is little water the best of feed cannot be used to its full carrying capacity. In such places the development of water is most important. The most feasible and the least expensive project in any given place is the one to be considered, whether it be the digging of wells, the making of borrow pits, or the developing of small reservoirs. With the increased supply of water the carrying capacity of the range thereabouts increases proportionately.

It stands to reason that traveling four or five miles to water requires more energy and feed to put on a certain amount of flesh than traveling a shorter distance would require. I would say that a mile and a half or two miles is as far as stock should have to go for water under ideal conditions.

In range where the livestock has to travel four or five miles to water, the stock will feed round the water holes, and the grasses will be overgrazed and trampled out in those areas, while good feed will be left

farther back from the water. Development of water is the only means of increasing the capacity of such areas.

In some places there might seem to be plenty of feed, which, however, upon thorough examination will prove to be those unpalatable grasses which stock will not eat readily. The actual reseeding of certain areas might be the only way of improving the forage to greater carrying capacity. In other sections the desired effect might be obtained by rotating, holding the stock off at those times of the year when the grasses would be going to seed. In all cases, of course, there should not be actual overstocking of the range.

Perhaps the most important element, and the most difficult to improve, is the third element mentioned--the common sense of the users. When his own case is called into question, every stockman will recognize the value of cooperation in use of the range.

Progress in improving all three of the foregoing elements will depend largely upon accurate knowledge of our needs. This information is being secured through studies at the Squaw Butte Station. Actual records and measurements are being kept on the weight gains made by cattle on different pastures.

The distance cattle will go from water to feed, without losing weight and without injuring the range, is being closely checked. Proper rates of stocking demonstrated at the station can be used as an index on our own ranges. That is the first and most important step.

By proper distribution of the stock, sufficient salting, exact compliance with the designated seasons of use, and general courtesy in range riding, the users in any community should be able to increase the carrying capacity of their range.

* * *

TRENCH TYPE RESERVOIRS LOOK GOOD

By S. K. Skinner
Oregon Grazing District No. 4
Jordan Valley, Oregon

At the meeting held late in August 1939, at the Squaw Butte Station, which I had the opportunity to attend, I was very much interested in many of the projects being worked out there and believe they will prove to be a source of valuable information and an inspiration to range stockmen in these western States. We have all realized for several years that our ranges were becoming depleted and the carrying capacity much lower than in years past, but aside from blaming first one cause, then another, few of us have done anything in a constructive way to improve these conditions.

The work being carried on now at the Squaw Butte Station embraces about all of the phases of the livestock industry, and the results of this work will be, or should be, of vital interest to all range stockmen. I was impressed by the workmanlike manner in which the work is carried on, and also with the enthusiasm manifested by all those connected with the station in the different projects being developed there.

As we have in our district large areas where there is insufficient water properly to service the range, and as we do have good grass on this area, I was particularly interested in the different types of artificial water holes that have been constructed at Squaw Butte Station. Our past practices have tended to deplete the range serviced by the living springs, by the congestion of livestock around the only available water. We are now more concerned with the problem of developing watering places on the parts of our range where there are no natural watering facilities. During the past three years, in conjunction with the Grazing Service, using 50 percent fund money, we have constructed a number of reservoirs and also developed several springs. Up to the present time our water hole construction has been mostly the earth dam reservoir type. We have had more

or less trouble with the dams washing out on account of the spillways becoming clogged with floating brush and debris.

It seems to me that our maintenance problems would be practically eliminated if we would use the trench type water holes developed at the Squaw Butte Station wherever the conditions would permit. In the last three years the Grazing Service has constructed well over 100 of these reservoirs in Oregon. I understand that our Alkali Lake CCC Camp has developed a technique whereby it can construct an average size trench reservoir in three to four days with a crew of five men, where riprapping is not required.

We have many ideal places to dig these trenches. All over this Oregon high desert country there are shallow lake beds, some of them covering quite a large area, that hold water for a short time after the snow melts, but owing to the large surface area and to the shallow depth of water the evaporation is so great that they soon dry up.

In my opinion if these lake beds could be trenched, the number and size of trenches depending upon the size of the lake bed and the amount of drainage, there would be ample water to last through the grazing period. At a nominal expense to the district we could make available, for livestock grazing, a large section of good grass country that we have been unable to use, except during late winter and early spring, and by so doing could relieve the congested parts of our range.

Another type of water development which shows promise for limited areas is a water-spreading type of reservoir. The purpose of this type of reservoir is to spread water over a large area for irrigation purposes, thereby greatly increasing the feed production on the flooded area. This type of reser-

voir was not developed at Squaw Butte Station, but has been used to very good advantage in District No. 1, Oregon, west of Lakeview. It is estimated that reservoirs of this type already constructed or planned for construction will increase the carrying capacity of that district by one-third. In that locality the native grasses have come in strongly on the flooded areas, which are covered by only a thin sheet of water. Stock graze around the margin of the reservoir, following the water line down as the water recedes. Livestock watering is a secondary use of such reservoirs, and when they dry up late in the summer water is available from other sources.

In my own neighborhood we have under

construction a reservoir which nearly all the stockmen feel is not properly located as a water hole, as it is located in the center of one of the worst overgrazed parts of the district; however, this project will give us the opportunity to observe the practical value of the water-spreading type of reservoir in this locality. It is planned to establish suitable species of grasses by artificial seeding.

I believe that water developments are the key to our whole range restoration program. Every effort should be made to develop types of reservoirs best adapted under the various conditions on all types of range. In my estimation development of the trench type reservoir already has gone a long way toward justifying the Squaw Butte Station.

* * *

FUTURE GRAZING SERVICE ACCOMPLISHMENTS DEPEND ON SQUAW BUTTE

By Victor F. Christensen
California Grazing District No. 2
Likely, California

Early in 1934 the ranch people in our grazing district learned from press dispatches that a bill had been presented to Congress for the proper administration of the public lands which would provide for their orderly use, improvement, and development. Meetings were held throughout the district, and before the Taylor Act was approved by the President our people had petitioned for establishment of a grazing district.

Years of abuse of our public range had reduced it from an outstandingly good grazing area to almost a worthless area of nearly a million acres. Prosperity declined with the condition of our grazing lands. Our area is so located and of such a character that it is only a livestock-producing area and always will be.

The uncontrolled use of the ranges led to improper seasons of use and overgrazing by transients or operators who had little interest in safeguarding the future needs of our people to such an extent that they were no longer able to operate successfully and were being forced out of business along with the owners of ranch and range lands.

Our district was established in April 1935, with the citizens of our district fully approving of the plan for administration, local advisory boards, and a group of

hard working administrators working for the legitimate stockman's best interest and the improvement of the public lands. Much has been accomplished to date. The stockmen have fully cooperated with the advisory board and the Grazing Service in adjusting seasons of use, changes in land ownership to round out base setups, and the elimination of livestock which did not have adequate base property use during seasons when not on public range.

Five years of administration have brought much improvement to the public range in our district, possibly as much as can be accomplished by livestock operators without the aid of experience and information that will come to the surface at the Squaw Butte Range Station.

The Squaw Butte Station is located on lands very similar to the grazing lands of our district and at a like elevation which is comparable to about 30,000,000 acres of public range in the several western States. For this reason it serves all the States with similar grazing lands, thus eliminating the necessity for numerous and duplicate stations in other States. The advisory board members from other States have an opportunity to bring their needs to the administrators of the station and also take information from the station back to their various grazing districts.

Actual investigations at the station directed by trained men will be of lasting aid in range improvement work such as water development, fencing, range rotation, deferred grazing, reseeding, and the study of types of plants which will grow in our semi-arid climate and furnish forage which has adequate feed value. These findings are much expanded and enhanced by having the station

attached to Oregon State Agricultural College, where there are laboratories and trained technicians to complete the studies.

From all indications the Squaw Butte Station is being operated in a businesslike manner and the results that are being accomplished will be of lasting value to the people living in the area where there is Federal range.

THE BATTLE AGAINST RODENTS

By Norvil M. Greener
Oregon Grazing District No. 6,
Halfway, Oregon

I am enthusiastic over the results achieved at the Squaw Butte Range Station. The many interesting facts brought to light there are a real help to the stockman who is sincerely trying to improve his range. It is only my desire to help this good work along that prompts me to make the following observations.

It seems to me that one of the quickest means of improving our range now lies in the direction of better rodent control. Due, perhaps, to the fact that coyotes and other predatory animals (which are the natural enemies of these pests) have been trapped and killed off in increasing numbers, Nature's balance has been upset and rodents are causing more damage every year.

Many instances could be cited to prove the gravity of the present situation and therefore the urgent necessity for better control, but the following is a quite typical example. When riding last fall on the head of the East Fork of Pine Creek, I was struck by the fact

that an area of not less than two sections of what had once been some of our best grass had been completely cleaned out by rodents. This stretch of range had been fine the year before, and since I knew there had been no unusual shortage of moisture or overgrazing just there, I got off my horse to check up on this surprising change. The evidence was unmistakable. It appeared to me that, after eating all that they could, the pests had systematically "hayed" the entire area for their winter fodder by cutting off the heads of all of the bunch grass before it could go to seed. Their "hay" was curing in the sun; I couldn't stay to see how they raked it up and moved it away!

In view of the above, I say with confidence that an early and effective campaign against rodents would be a tremendous help in the battle to conserve and improve our range.

(Note: Rodent studies are being carried on at Squaw Butte to determine the actual amount of damage done by various kinds of rodents.)

STREET CARS ON THE RANGE

Abandoned street cars are being remodeled and repaired by the Grazing Service to fit them for use as Civilian Conservation Corps mobile side camps.

When complete the units will be composed of a kitchen-dining car, bunk cars, and wash room and storage car, with all the comforts

of home for a group of enrollees assigned to the Grazing Service to develop public range areas in western United States.

These units, which can be developed at a small cost, are superior in many ways to the usual tents or portable buildings used and still have the advantage of removal from one area to another as projects are completed.

GRAZING LICENSES ISSUED BY THE GRAZING SERVICE
UNITED STATES DEPARTMENT OF THE INTERIOR
1939

State	District	No. of Licenses	Numbers of Livestock				Total Livestock
			Cattle	Horses	Sheep	Goats	
Arizona	1	239	16,331	420	108,064	13,165	137,980
	2	93	13,561	662	10,834	10,140	35,197
	3	50	4,923	206		400	5,529
	4	221	20,048	971	209	15,637	36,865
	Total	603	54,863	2,259	119,107	39,342	215,571
California	1	228	24,595	667	198,725	527	224,514
	2	491	44,672	2,620	167,315	100	214,707
	Total	719	69,267	3,287	366,040	627	439,221
Colorado	1	440	37,896	1,573	301,873	35	341,377
	2 **	171	31,001	441	59,718		91,160
	3	815	72,980	2,385	326,168	12	401,545
	4	292	16,187	665	141,938	69	158,859
	6 **	160	4,175	476	122,272		126,923
	Total	1,878	162,239	5,540	951,969	116	1,119,864
Idaho	1	851	70,449	5,803	536,660	61	612,973
	2	1,809	43,372	3,521	520,040	21	566,954
	3	874	20,206	2,344	490,781		513,331
	4	408	29,029	2,646	113,795		145,470
	Total	3,942	163,056	14,314	1,661,276	82	1,838,728
Montana	1	23*	20,661	3,823	184,098		208,582
	2	385	12,272	5,458	135,640	12	153,382
	3	532	34,122	5,046	236,412	36	275,616
	4	104	4,065	415	43,966		48,446
	5	249	22,245	1,707	110,819	10	134,781
	6	29	6,617	1,378	39,823		47,818
	Total	1,322	99,982	17,827	750,758	58	868,625
Nevada	1	523	161,965	6,728	317,625	14	486,332
	2	575	69,317	4,628	266,680		340,625
	3	366	14,748	672	187,721	1,130	204,271
	4	416	19,316	1,383	290,007	667	311,373
	5	98	4,197	543	19,080	35	23,855
	Total	1,978	269,543	13,954	1,081,113	1,846	1,366,456
New Mexico #	2-a	414	13,304	498	94,740	1,901	110,443
	2-b	238	20,206	763	62,415		83,384
	3	448	78,197	3,274	9,430	23,649	114,550
	4	221	31,833	2,193	48,225	22,046	104,297
	5	60	13,122	1,073	16,156	8,543	38,894
	6	500	93,800	4,494	298,056	8,101	404,451
	Total	1,881	250,462	12,295	529,022	64,240	856,019
Oregon	1	48	5,551	149	7,850		13,550
	2	410	51,946	3,722	194,466		250,134
	3	402	35,486	3,387	149,802		188,675
	4	144	23,554	2,260	60,075		85,889
	5	211	16,411	1,305	42,432		60,148
	6	308	22,193	1,126	47,102		70,421
	7	42	777	4	35,125		35,906
	Total	1,565	155,918	11,953	536,852		704,723
Utah	1	596	29,783	2,820	310,875		343,478
	2	700	17,473	653	681,310		699,436
	3	1,068	28,967	700	490,081	1,440	521,188
	4	884	21,909	554	364,278	23,975	410,716
	5	562	20,265	1,524	122,910		144,699
	6	204	17,081	787	116,235		134,103
	7	689	29,744	1,970	162,621	3,305	197,640
	8	320	15,088	919	213,242		229,249
	9	155	12,025	515	157,366		169,906
	Total	5,178	192,335	10,442	2,618,918	28,720	2,850,415
Wyoming	1	458	33,509	2,812	315,926	3	352,250
	2	204	20,485	1,936	166,135	2	188,558
	3	262	33,250	3,009	455,509	10	491,778
	4	433	30,329	3,838	488,145	206	522,518
	5	186	37,784	2,902	75,552		116,238
	Total	1,543	155,357	14,497	1,501,267	221	1,671,342

* Montana Grazing District No. 1 is covered by cooperative grazing associations.

** Includes both licenses and term permits.

No licenses issued in New Mexico District No. 7 during 1939.

SUMMARY OF GRAZING LICENSES ISSUED BY THE GRAZING SERVICE,

UNITED STATES DEPARTMENT OF THE INTERIOR, FOR THE YEAR 1939.

STATE	NUMBER OF DISTRICTS	NUMBER OF LICENSES	CATTLE	HORSES	SHEEP	GOATS	TOTAL LIVESTOCK
Arizona	4	603	54,863	2,259	119,107	39,342	215,571
California	2	719	69,267	3,287	366,040	627	439,221
Colorado	5	1,878	162,239	5,540	951,969	116	1,119,864
Idaho	4	3,942	163,056	14,314	1,661,276	82	1,838,728
Montana	6	1,322	99,982	17,827	750,758	58	868,625
Nevada	5	1,978	269,543	13,954	1,081,113	1,846	1,366,456
New Mexico	6	1,881	250,462	12,295	529,022	64,240	856,019
Oregon	7	1,565	155,918	11,953	536,852		704,723
Utah	9	5,178	192,335	10,442	2,618,918	28,720	2,850,415
Wyoming	5	1,543	155,357	14,497	1,501,267	221	1,671,342
TOTAL	53	20,609	1,573,022	106,368	10,116,322	135,252	11,930,964

RANGE MANAGEMENT
IN THE FEDERAL GRAZING DISTRICTS

By E. N. Kavanagh
Chief, Range Management

According to the dictionary the little word "range", surprisingly enough, has many different meanings and uses in the English language. To a western stockman "range" means something which to the eastern or middle-western stockman is usually spoken of as "pasture." However, even the western stockmen and other persons familiar with the range country have differing ideas about the meaning of the word. Hook another word with "range" to make the phrase "range management," and we find that "management" likewise performs many jobs in the English language, and the proper interpretation of "range management" becomes even more difficult.

The phrase, range management, has come to occupy a very important place in discussions of our national economic problems and of the conservation of our natural resources. For this reason what it is, how it works, and what it accomplishes are questions of vital interest to every citizen of the country, no matter where he may reside.

Range management, as we think of the phrase in the Grazing Service, means regulated use of grazing land and the water and feed resources thereon. It means the control of animals that live upon or are permitted to graze on these areas. It involves control by the stockman of his domestic animals and control by the States of wild animals such as antelope and elk. Consequently, the stockman, the State wildlife authorities, and the administrative personnel of the Grazing Service all have a direct interest in range management on the Federal ranges to secure the best possible management plans. In a larger sense, range management means providing the greatest continuing public benefits, socially and economically, to everyone in the range country whether he is directly or indirectly affected by the livestock industry.

Range management is not a one-man job, nor is it a one-organization job. Regardless of the fact that the Grazing Service is the agency held responsible for the administration of the ranges in the Taylor Grazing districts and for actual improvement of conditions of these ranges, there is a constant need for advice and help from all who are interested in making this country an even better place in which to live than it is now. Citizens everywhere are interested in what happens in the range country. They are interested in the social and economic welfare of the people who live in the range areas. They are also interested in the raw materials

that are being produced from these areas for the channels of trade—products which in turn enable the western producer to purchase commodities from other sections of the country, thus keeping the wheels of industry turning.

Range management on the 141,000,000 acres of Federal range, with which there are intermingled 123,000,000 acres of State, railroad, county, and private land, is a job to be approached with an open mind and humbly because of the opportunity to do good or harm. These lands form a "jigsaw" pattern that provides feed for nearly 12,000,000 head of livestock and many thousands of wildlife. In a large measure they embrace watersheds of the principal rivers of the West and internationally famous reclamation projects.

What are we trying to manage? The range lands and waters, the grasses, browse, and other natural resources in 53 grazing districts in the 10 western States of Arizona, California, Colorado, Idaho, Montana, Nevada, New Mexico, Oregon, Utah, and Wyoming. What are the conditions on these ranges now? Conditions in many areas are not what they should be according to information obtained by range surveys, from stockmen, from range studies, and from reports of State and other Federal agencies. They can all be improved, and it is here that range management comes into the picture.

The demand for use of the range is much greater than can be satisfied under present range conditions. This present-day demand in a large measure reflects directly the needs of the dependent population for rounded out and stabilized operations if their social and economic needs are to be met. It also reflects a condition which will not permit any drastic reductions in producing capital (livestock) without resultant disaster to the social and economic structure.

It is apparent, therefore, that in the determination of how best and when to use the western range resources the stockmen and the Grazing Service are faced with a responsibility of maintaining the existing social and economic structure while rehabilitating the range resources to meet the real demand—a dual task in conservation.

Theoretically, it would be possible to make early and marked improvement on the Federal ranges if there was a resort to drastic action in the way of reductions in use of the range to allow Nature complete

freedom in natural restoration. But the danger of such arbitrary action has been pointed out. The Secretary of the Interior has provided the Grazing Service with administrative regulations that afford progressive, advised advance toward the desired goal. In dealing with the range and all its varied conditions, these regulations permit full utilization of the stockman's wealth of experience. The program, calling for the rapid discontinuance of all improper range uses, coupled with the construction of needed range improvements, is backed by real cooperation from the range users. In the short period of five years it has proved to be a successful way of approach to the desired goal.

The Director of Grazing has authorized the issuance of term permits in all grazing districts or any proper administrative portion thereof when a substantial agreement concerning the practicability of the issuance of such permits has been reached between the users of the range and the advisory and administrative personnel of the Grazing Service. Range stockmen, with few exceptions, when assured of continuous use of certain range for a period of years, have shown a personal, constructive interest in range improvement and proper range use and a willingness to cooperate fully in range conservation work.

We have, therefore, on the occasion of the sixth anniversary of the Taylor Grazing Act, the object lesson of thousands of range

managers working together under a general program with limited direction by administrative officials toward the accomplishment of a goal admitted to be not only desirable but necessary if the range livestock industry, keystone of the social and economic structure in the West, is to be placed on a sound and permanent foundation. This program--a combination of administrative and advisory work--has already produced some excellent results and promise of more rapid and favorable reactions than were expected even by the more optimistic persons when the work was undertaken in 1935.

Range management under the above program has ceased to be a subject for academic discussion. There is no place for arbitrary action by administrative forces. The program has developed into a unified effort by the western stockmen and the Grazing Service to rehabilitate and improve the range areas and stabilize the whole economy. Other agencies and other interests are becoming interested in the program and its democratic approach to a national problem. They are beginning to cooperate more and more closely in the general program. It does not seem too much to expect that in the near future, with a better unified and more closely correlated effort, even greater strides can and will be made than during the past five years to the end that the purposes of the Taylor Grazing Act will be met. Through proper range management western range areas will be revitalized and the stockmen will benefit by stability in their operations.

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GRAZING SERVICE PROGRAM EXPLAINED TO STUDENTS OF CONSERVATION

Range Examiner Hugh M. Bryan delivered a series of lectures during April to students and faculty interested in range management and conservation at Oregon State College, Corvallis, Oregon, and Colorado State College, Fort Collins, Colorado. The subjects of these talks, which were illustrated with maps and charts, covered the program, objectives, and wide range of activities conducted by the Grazing Service.

Speaking on behalf of the Oregon College, Dean Wm. A. Schoenfeld said:

"All who attended Mr. Bryan's lectures came away with a broader viewpoint in the field of range management and a far greater respect for both the responsibility and approach to these problems by the Grazing Service.....I want to commend your organization for its foresight in setting up this means of furthering the causes of range im-

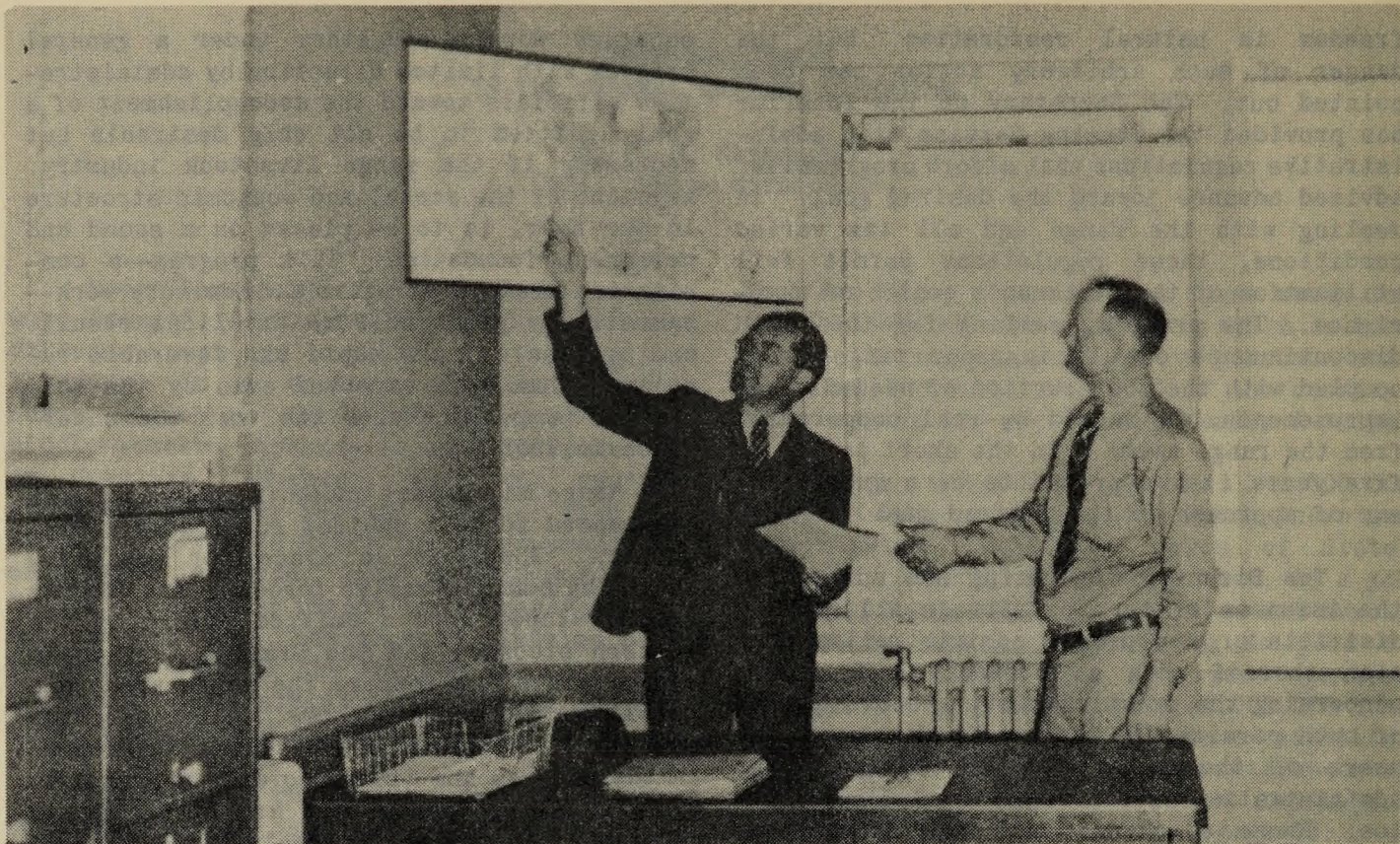
provement and the stabilization of the range livestock industry."

The Grazing Service was invited to repeat the series of talks at the Utah State Agricultural College, Logan, Utah, and Mr. Bryan gave his lectures before students in the School of Forestry and Range at that college during the latter part of May.

* * *

RANGE DEVELOPMENT PROVIDES EMERGENCY WATER SUPPLY FOR WESTERN TOWN

When the town reservoir at Fruita, Colorado, became clogged with ice and snow a temporary pipe line was installed from a Grazing Service well to the town's own pipe line to relieve the acute situation. The temporary line was removed as soon as the emergency ceased to exist.



Rancher Tom Bell of Orogrande, New Mexico, receives from Regional Grazier Dierking the first long-term permit to graze livestock in New Mexico Grazing District No. 5.

NEW MEXICO GRAZING DISTRICT GOES ON TERM PERMIT BASIS

As the Grazing Service prepared to observe the sixth anniversary of the passage of the Taylor Grazing Act, Regional Grazier C. F. Dierking began the issuance of ten-year permits in New Mexico Grazing District No. 5.

On April 25, Tom Bell of Orogrande, New Mexico was handed the first long-term permit issued in the State of New Mexico under the Taylor Grazing Act. Mr. Bell is a typical small livestock operator of the southwestern region. His permit is for 121 cattle during the period of May 1, 1940 to April 30, 1950. The individual allotment within which these cattle are permitted to graze is composed of public land and an intermingled area of private and State land owned or controlled by Mr. Bell. The allotment is fenced and on the controlled lands are privately owned stock water developments which, upon examination, have been found adequate to service the allotted range on a year-long basis.

Mr. Bell's permit was issued for 80 percent of the total estimated carrying capacity of the allotment. The remaining 20 percent is reserved to take care of drought emergency or other contingency which may arise during the life of the permit. Adequate provision has been made for a reasonable number of wildlife to share jointly with the permitted livestock in the use of the allotment.

New Mexico Grazing District No. 5, located in south central New Mexico, was established under the terms of the Taylor Act on April 8, 1935. Its gross area of nearly 3,000 square miles, which is almost as large as the area of the States of Delaware and Rhode Island combined, is by nature limited to the production of meat, leather, wool, and mohair through wise husbandry of the grass and astute care and development of a limited water supply. Two-thirds of the land (1,234,360 acres) in the district is public domain.

More than 50 years ago, when water holes in Texas became overused by the increasing number of livestock, cattlemen began sifting into this part of New Mexico with their herds. Grass was plentiful but water was scarce. It was a long way between the Texas border and the Sacramento Mountains which adjoin this district on the north. In between there was no permanent water. Cattlemen who pioneered this new grazing territory quickly realized the need for conservation of the limited water supply. They developed methods of storing the runoff which came from the late summer rains behind large, earth-filled dams. At first, the efforts were directed mainly toward providing seasonal or "drift-herd" water to satisfy seasonal movements between Texas and the Sacramento Mountains.

Soon it was discovered that cattle thrived on the variety of forage all year long in areas where year-long water was available. This led to the development of better and bigger storage facilities and soon there was a system of water development that has become the pattern for range reclamation and use in large areas of the arid southwest.

Water is the controlling factor of range management and livestock husbandry in this

little grazing district which contains neither a living stream, town, nor trading post. Upon a fair, equitable, and fully cooperative basis, coupled with five years of study and adjustment, the grazing district has been subdivided into allotments. A total of 12,895 cattle, 1,152 horses, 19,565 sheep, and 5,546 goats are afforded year-long grazing use on the privately controlled and public lands serviced for a proper use by the stock water developed through the perseverance and hard work of the local residents.

* * *

DIRECTOR RUTLEDGE ADDRESSES EIGHTH AMERICAN SCIENTIFIC CONGRESS

Director R. H. Rutledge was appointed as a delegate to the Eighth American Scientific Congress in Washington May 10 to 18. The Congress, which serves as a medium for the exchange of scientific information of particular interest and importance to the governments and peoples of the Americas, dates from the first Latin American Scientific Congress held in Buenos Aires in April 1894. In 1908, the United States was invited to participate and it was in that year that the name of the Congress was changed to the First Pan American Scientific Congress.

Among those participating in this meeting were representatives of the 21 Republics of the Pan American Union who were in Washington to observe the 50th anniversary of the founding of the Pan American Union.

Director Rutledge took part in the discussions on agriculture and conservation and addressed the Congress on "The Importance of Range Conservation to the National Welfare." A resume of his address is given here.

RESUME

The United States Patent Office celebrated its 150th anniversary this year. During that century and a half the patent system has encouraged the genius of hundreds of thousands of inventors and fostered the comfort and prosperity of millions. American industry has flourished and a small, struggling nation has grown into the greatest industrial power on earth. Devices and processes by the millions have been developed to create new wealth, add new conveniences and make this a better world for human habitation.

Despite the advances witnessed by important discoveries and developments, there have been no changes in the fundamental laws of nature. The sciences have found no way other than the natural way for producing a beef steak or a lamb chop. Grass still requires soil for its survival and soil is still subject to erosion wherever water runs downhill. The basic food requirement of man must still be produced in the natural way through wise husbandry of Nature's elements.

The transition of America from a nation predominantly agricultural to one predominantly industrial has aroused national interest in the range problem.

In the aftermath of World War expansion followed by drought, depression, dust storms, and shifting populations, America began seriously to take stock of her natural resources. The inventory revealed that a sizable part of our economic and social problems were traceable to a dwindling of range resources. Among other things the evidence led to the conclusion that to insure the foundation for a desirable standard of living in the range country and in the nation generally there must be an adequate area of forage-producing land and a range conservation program designed to foster its continued productivity. To secure such a program Congress passed a number of conservation acts and placed the conduct and coordination of that program in several Federal agencies. Through the guidance of the Federal government and the cooperation of States and citizens, range conservation is going forward on a wide front.

Under the Taylor Grazing Act of 1934, the Grazing Service, Department of the Interior, is handling 140,000,000 acres of public land in 10 of the western States upon which are grazed, under regulation, about 12,000,000 of the nation's livestock and a considerable portion of America's deer, elk, antelope, and other wildlife. The approach to successful operation of this large area of land and the conservation of the natural resources thereon is based on fundamental principles of land use that are carried into effect through co-operation of all the interests involved.

The western range country comprises about half of the total area of the United States. It consists of 11 far western States and sizable portions of the six adjacent Plains States. Its gross area of about 1,525,000 square miles is slightly greater than the total of Bolivia, Chile, Colombia, and Ecuador and its grazable land containing about 1,137,000 square miles is comparable to the area of Argentina.

Three-fourths of the wool and mohair, half of the lamb and mutton and nearly one-third of the beef and veal consumed in the United States are produced in the western range area. Nearly half of the land is in private ownership; the remainder is public land belonging to States, counties, and the Federal government. Collectively, these lands comprise the nation's most important watersheds and within their borders are found practically all of this country's irrigation projects.

Practically all of the development and settlement of this vast area has occurred within the past 75 years. In a growing nation possessing seemingly unlimited resources there was no guidance, no general plan to assist the citizens in its development. It was inevitable, therefore, that under existing trial and error methods many mistakes occurred.

In this area of variable climate, precipitation, altitude, and soil texture there is a delicate balance between plant growth and these factors. There is likewise a delicate balance between plant growth and factors of land use. The economy of the region and the effect of the whole program and its combination of problems are incorporated into the general plan.

Livestock numbers are limited to the safe carrying capacity of the land through the issuance of licenses and permits to resident users of the range. Studies are made to determine proper seasons of range use, the class or classes of livestock that can use the range most beneficially, and the feasibility of withdrawing from use certain areas to effect rehabilitation by both artificial and natural means.

The problem of range management involves a study of the relationship between private and public land and the devising of plans to make the use of all the lands compatible with the available resources and the economic structure. Range improvements consisting of water development, reseeding, erosion control works, trails and other facilities, and the elimination of undesirable elements such as rodents, predators, and poisonous plants are included in the program.

Units to facilitate particular administrative objectives and to localize problems in conformity with community and region welfare assure a broad attack on social and economic, as well as physical fronts. By this means the program is enabled to outline and develop a type of land use that, in the end, will insure the stability of the unit involved. In turn this unit, whether it be a grazing district, a national forest, an Indian reservation, a game range, or any suitable allotment or portion thereof, will reflect the benefits derived on the public welfare generally.

* * *

CCC FIRE TRAINING PUT TO PUBLIC USE

Enrollee training in range fire-fighting resulted in the performance of public service with distinction when fire broke out recently in the little town of Delta, Utah.

From the nearby Grazing Service CCC camp almost before the alarms had ceased came the enrollee fire crew in trucks. From the railroad water tank at the edge of town the boys

hauled water in barrels and formed a bucket brigade from the trucks to the burning buildings. Before long they succeeded in controlling the blaze which threatened to wipe out a large part of Delta's business district.

This little western town, situated in an irrigated valley at the edge of the desert where CCC forces are engaged in rebuilding the Federal range, is 100 miles from any regular fire-fighting equipment. The citizens of Delta were generous in their praise of the work of the enrollee crew.



The originator and present administrator of the Taylor Grazing Act—Congressman Edward T. Taylor and R. H. Rutledge—pause before a portion of the special Grazing Service exhibit in the Art Gallery of the Interior Department Building in Washington to discuss conditions on western ranges of the United States.

SPECIAL GRAZING SERVICE EXHIBIT

Range conservation as it relates to human welfare was depicted in a special Grazing Service exhibit in the Art Gallery of the Interior Building in honor of delegates to the Eighth American Scientific Congress who were in Washington from May 10 to 18.

The exhibit, which was built around the theme of western range life, graphically described by maps, charts, and photographs the problems that are inherent where grass is the principal natural resource and stock-raising the foundation of the social and economic structure.

In extending an invitation to our South American neighbors to view the grazing exhibit, Secretary of the Interior Harold L. Ickes said:

"Pastoral pursuits have always been one of the principal occupations of the human race. The livestock industry in the United States had its beginning in 1540 when Coronado led his courageous band of explorers into what is now New Mexico. The Spanish dons and the mission padres quickly realized the possibilities of grazing their sheep and cattle on the mountain ranges in summer and on the broad flat valley land in the winter.

From the early Spanish expeditions into what is now United States territory sprang the foundation herds of our present range livestock industry. It is fitting that this country on the 400th anniversary of Coronado's expedition should not only be celebrating that notable event but also at the same time have the honor of entertaining the distinguished visitors from the Pan American governments on the occasion of the Eighth American Scientific Congress.

"Four hundred years have witnessed tremendous changes in the cattle country of the West. Four centuries of pioneering and exploitation are now being succeeded by a new era of conservation. The livestock industry, one of America's greatest, depends upon prudent use and management of the range resources in order that it may continue to survive and prosper.

"To foster that principle, Congress passed the Taylor Grazing Act of 1934. The Grazing Service, Department of the Interior, with the help of the local stockmen, is carrying out the purpose of this act on more than 140,000,000 acres of Federal range."

COYOTE HUNTS ARE CONSERVATION AID

Coyotes in Montana, Idaho, and other grazing States really have something to howl about these days. Stockmen and Grazing Service officials, aroused by serious predator depredations against livestock and wildlife, have joined forces in a campaign to reduce the number of coyotes on grazing areas of the West.

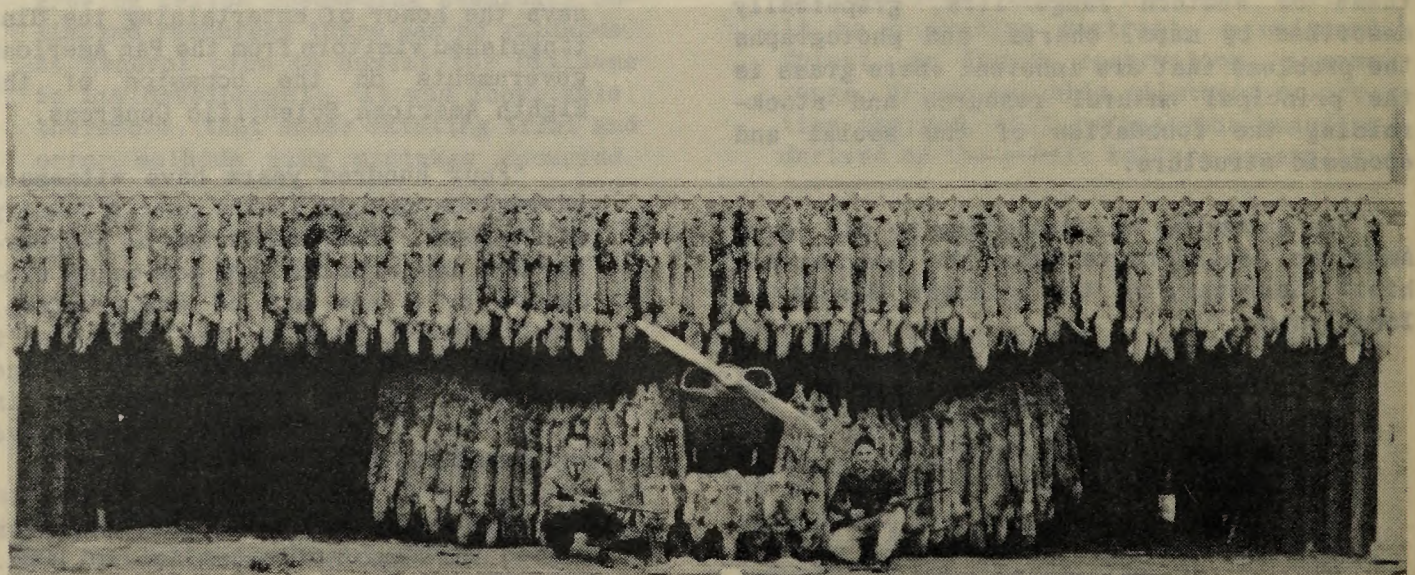
In Montana one plan of attack has been from an airplane. Flying low, and at slow speed, experienced "airplane hunters" spot the enemy and shoot from the cockpit. During the past winter, two young cowboy sky pilots, with adventure and stockmen's bounty as a reward, killed approximately 150 coyotes in one district in Montana. As a general thing the coyotes killed in these "air raids" are the old, smart fellows who have evaded traps and poison. Many of them are cripples and unusually bold, flagrant killers of lambs and wild fowl.

According to Biological Survey reports, 93,000 coyotes were killed in 1939. When one realizes that each of these crafty animals killed at least one or more domestic or wild animal, the cost of their depredations amounts to startling figures.

Gene Etchart, son of a Montana District No. 1 advisory board member and a pioneer in

attempting to rid the range of coyotes from the air with his small, two-seated plane, writes:

"Usually coyotes are thickest where game or other animals become easy prey. They may be found trailing a bunch of antelope or deer or prowling in sage-bordered creeks for grouse or sage hens. It is not unusual to jump four or five coyotes in a pack. As the plane approaches the coyote becomes frightened and runs. He is then an easy target. However, if he stands motionless, as is sometimes the case, it is very hard to distinguish him from the sagebrush and other vegetation with which his color blends. Once the coyote is spotted the gunner opens his window and the pilot turns the plane to approach the coyote from the rear, stalling the speed to a minimum. The plane is flown about 10 feet from the ground and about 30 feet to one side of the coyote. If conditions are right the gunner will get two or three shots during one pass. Ammunition used is No. 1 buckshot, or BB shot. The most excitement occurs when several coyotes are jumped in a bunch and it is necessary to kill them before they scatter and hide. After a kill the plane is landed in some convenient opening, the animals skinned and the pelts taken perhaps ultimately to become an item in milady's wardrobe."



Gene Etchart, son of a Montana grazing district advisor, and Orville Markle are shown with part of the coyotes killed by them from an airplane in Montana Grazing District No. 1 during the winter of 1939-40. (c) Coles Photo

